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Combat Crew

strategic air command

★★★★

MAY 1978

THE GOAL: REALISM

Brig Gen Patrick J. Halloran
SAC Inspector General

You've seen the general pattern develop before, haven't you? It's been a year since your last Operational Readiness Inspection (ORI). Your crew has studied the new Emergency War Order (EWO) and ORI procedures and certified to the commander that each member is capable of accomplishing duties for which he constantly trains. The squadron commander is getting a little nervous about whether you can be recalled fast enough. Shop supervisors in logistics and support organizations are nervous too. Speculation runs high, the belt tightens another notch and the fever goes up another one or two degrees. Then it happens — those ten minutes of harried rumors — the ORI is a reality. It's here, NOW!

Why today? Do ORIs just happen?

"Today" has been coordinated throughout USAF and MAJCOM Headquarters to insure that inspection efforts do not conflict with major on-going military exercises or with other inspection efforts. Today, your organization will be inspected without major conflict and with minimum impact on the Air Force's overall mission and readiness posture.

ORIs don't just happen. As a measure of a combat or combat support unit's performance and capability to accomplish its assigned missions under simulated combat conditions, an ORI goes into the planning stage weeks or months before those harried rumors herald its initiation. From inception through initiation, and conduct to termination, it is incumbent upon my staff to set the stage for a realistic appraisal of wartime performance and capability within the constraints imposed by the need for peacetime safety and cost effectiveness. Thus, from the drama arts, we borrow the term, "scenario," which we have militarily defined as, "An outline plan of actions to be undertaken during a projected exercise or maneuver." It is my immediate goal to insure that ORI scenarios are developed and presented as realistically as possible to assist in the evaluation of your unit.

Looking at the term "scenario" in its larger sense, it is the "big picture" of an ORI — a big picture which is the end result of many, many individual scenario inputs. The one input which you are familiar with, of course, is the ORI Emergency Action Message transmitted from the SAC Command Post. (The one that transformed those final ten minutes of rumor into reality.) It is a scenario input designed by HQ SAC and selected by the IG as the instrument to initiate this periodic test of your unit's primary Designed Operational Capability (DOC). Realism is inherent in the very format and content of the Emergency Action Message.

For aircraft units, the mission route, timing, and altitude constitute another scenario input. Developed in part by the First Combat Evaluation Group (1 CEVG) and by the unit staff, the profile approximates a mission any bomber crew could be assigned in fulfillment of the unit DOC. A route developed for the mated tanker serves as an input to the scenario of a tanker unit ORI. IG inspectors flying on selected bomber and tanker sorties use the scenario to evaluate aircraft and aircrew alike. Are established rendezvous procedures followed? How about Terrain Avoidance/Terrain Following Radar? Do you fly an acceptable profile, or do you merely pay it OLIVE BRANCH lip service? The opportunity for realism is there. Do **you** take advantage of it?

At MINUTEMAN and TITAN units, inspectors select a cross-section of the crew force for evaluation in the missile procedures trainer. Each crew is presented actual EWO messages and problems which have been developed by the SAC staff. The crew is expected to respond as if it were an actual situation. The trainer computer presents responses to actions taken, as realistic as possible without actually launching missiles. Take advantage of the time you spend in the trainer. It is a unique opportunity to prove you understand the EWO mission.

As an executive decision-making body, the unit battle staff is prime for scenario inputs. Exercise of

SAC's support of the EWO almost goes unstated in that SAC was born of that need. But what about GIANT LANCE, Limited Nuclear Option (LNO), missile retargeting, dispersal, and other implementation options? A scenario input stating, "CINCSAC has directed . . .," puts the decision-making gears into action. The staff is then evaluated on their knowledge of unit support to existing plans and their ability to react and commit forces under that option.

Next, perhaps the intelligence representative briefs the Commander and staff of heightening tensions on political and military fronts throughout the world — a reaction to another scenario input — this one originating, again, within HQ SAC. Such realistic simulations occur routinely in the command post atmosphere of the Commander's assembled battle staff. My inspectors watch for a realistic approach and solution to each problem as it is presented.

How far do we carry the scenario? As far as safety, security, good business, and common sense will allow! While crewmembers are concentrating on the EWO generation and/or the ORI, here are some examples of inputs being fed in at key points around the base:

- A robbery attempt at the NCO Club tests security police anti-robbery procedures.
- An attempted hijack of the transient KC-135 on Delta row exercises unit anti-hijack plans.
- A smokepot billowing white smoke simulates a disastrous incident encompassing four barracks, a chow hall, and one corner of the flight line, thus putting base disaster preparedness plans to the test.
- Another input establishes a dissident political group at the main gate who, armed with slogans and handguns, demand "peace at any price." Or perhaps, a simulated attempt is made to penetrate a missile launch facility a hundred miles away.
- Unit response to emergency action messages simulating launch and execution of the EWO force completes the scenario.

I am personally committed to total realism in an ORI. My inspectors act accordingly. While traveling throughout the command, we see many people striving for this same high degree of realism — each man using the ORI to safely demonstrate his combat role. How about you? Do you train to accept a realistic wartime scenario? Or do you simply train to pass an ORI? ★★

Combat Crew

Magazine of the Strategic Air Command - 28th Year of Publication

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ON OUR COVER

The B-52 and its crew, operating in a critical phase of flight, face the hazards of approach and landing. For more on this subject, see pages 8.

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COMBAT CREW is an internal publication of the Strategic Air Command with the sole purpose of promoting safety. The contents of this magazine are informative and not to be considered as directive in nature. Facts, testimony and conclusions of all mishaps printed herein may not be construed as incrimination under Article 31 of the Uniform Code of Military Justice. All names, dates and places used in conjunction with mishap stories are fictitous. Written permission must be obtained from Headquarters, Strategic Air Command, before any material may be reprinted by other than U.S. Air Force organizations. Use of funds for printing this publication has been approved by Hq. USAF. Contributions are encouraged, as well as comments and criticisms. Direct correspondence with the Editor is authorized. Address correspondence to Editor, COMBAT CREW, Hq. SAC/DOSE, Offutt AFB, Ne. 68113.

Your Safety Officer Speaks

Captain William C. Kassen
7th BMW, Carswell AFB

If you are interested in a safe working environment then you'll be interested in the work done by the safety officer — work done *for you*. You may also become interested in a position in the safety field for your next assignment.

The book says my functions encompass policy planning, program formulation and directing and monitoring safety programs. Included in our field are supervisory and technical responsibilities for mishap prevention, mishap investigation and reports, analysis, hazard identification, systems safety engineering, incentive awards, and safety education.

I start at the top because I work directly for the wing commander. Next to you, he's the man most responsible for a safe operation. I am directly responsible for advising him, and his staff, on courses of action to follow to minimize personnel and materiel losses due to mishaps. I help plan and supervise the safety activities that involve unit weapon systems. I participate in mishap investigation boards, assist in forming these boards and disseminate findings as a part of the mishap prevention program. I also perform as a system safety engineer, and conduct and supervise special safety training programs.

Yes, the book gives me many jobs to do, but I have lots of help. I have all of you, the crewmembers, maintenance and support people. You are the eyes and ears of safety.

"Okay, how does the system work?"

I'm going to tell you how we help make a safer working environment for you. After all, you are a most important person.

Had a wet missile or near midair lately? Let's hope not, but the potential is always there.

Reporting and investigating these situations will definitely improve safety. Report and investigation information obtained from missile and aircraft mishaps is used *solely for future mishap prevention* not for disciplinary action.

Here's your chance to tell your supervisor where to go . . . to go and get hazardous conditions corrected. Air Force Regulation 127-6 gives all Air Force personnel the means to alert supervisors (through the safety office) of hazardous conditions requiring prompt corrective action. The USAF Hazard Reporting System also provides a means for disseminating safety and health information to commanders of units employing identical or similar equipment. The safety officer evaluates, investigates and forwards (to the unit or agency which has the expertise in that area) all reportable hazards involving flight, ground, explosives, health, missile, or nuclear safety.

The safety officer takes an active part in the investigation of a wide range of mishaps. Mishaps are classified according to severity levels. That is, the total cost of damage and injury will determine the classification of the mishap (DOD Class A, B or C).

When an aircraft, ground or missile mishap occurs, the information is disseminated throughout like units and units that could benefit from the safety implications of the mishap. Much of this safety information is passed on to you through safety meetings and information files. All of the information is available to you in the safety office.

High Accident Potential (HAP) reports are used to identify significant hazards which do not meet the damage and/or injury criteria, but a similar occurrence could result in injury criteria, but a similar occurrence could result in injury or damage. These reports are also distributed to the safety units of like concern or interest. In other words, let's stop a potential safety problem at our base by learning from the experience at another base.

Your safety officer conducts safety inspections on both a formal and spot type basis. These inspections are designed to discover unsafe conditions or acts, determine reasons for their existence and recommend actions to correct the problem areas. He will follow up to make sure that corrective actions have eliminated the discrepancy and the possibility of its recurrence.

A monthly formal inspection is made of the airdrome. A yearly inspection is conducted in the following areas: AFCS and control tower, Base Operations, Fire Department and Crash Rescue, Weather Service, Aircrew and Life Support section, Command Post, Transient Maintenance, and each of the tactical squadron safety programs. Formal inspections are conducted every six months for those areas classified as high hazard or industrial areas. Low hazard or nonindustrial areas are inspected by additional duty safety officers on an annual basis. The spot inspection, the backbone of the safety inspection, determines the degree of safety standards existing when an inspection is not anticipated.

To help create and maintain a safer environment, your safety officer must be well informed on all aspects of the organization's mission and be very familiar with related staff functions. Safety has representation on many boards and committees which involve the unit mission. The attendance and participation at these meetings offers the opportunity to become knowledgeable of the wing functions on a command level.

The safety officer maintains a working relationship with the various maintenance functions. Almost on a daily basis the safety officer will be working with the Quality Control and Evaluation Division, Maintenance Control Division, and all other support branches. There are few functions within the base complex where the working relationship does not exist.

SAFETY ASSIGNMENTS

Assignment to a position in safety offers unique advantages to officers of high potential and proven capabilities. It presents an ideal training ground for officers exhibiting squadron commander potential. Occupying a job demanding involvement in all aspects of base activities, the safety officer receives excellent career broadening experience. He works directly for the commander and therefore gains valuable insight into leadership and management techniques. Additionally, rated safety officers continue to fly unit mission aircraft.

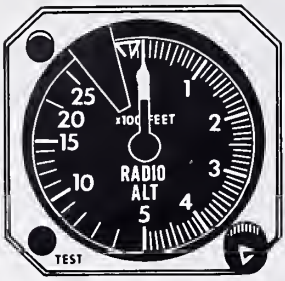
During these times of austere budgets, reduced manning, decreased experience levels, aging equipment and increased emphasis on nuclear surety, the role of the safety officer is more important than ever before. It is essential that we have only the highest quality individuals monitoring and advising on the safety of our vital resources.

If you are looking for a challenge and have the capacity for sustained, conscientious management of widely varied programs, think about a tour in safety — challenging but rewarding — We need a few good people.

Safety cannot operate in a vacuum. We all must actively cooperate to establish and maintain a safe working environment. As I stated before, all of you act as the eyes and ears for the safety program. Through you, we can prevent mishaps from happening. We can prevent injury and loss of life; we can also save a great many of our valuable tax dollars.

Our primary responsibility as commanders, crewmembers, support personnel, and safety officers is mission accomplishment, our goal is to accomplish it safely. A main responsibility of a safety officer is to identify hazards, bring them to the attention of the responsible individual or staff agency, monitor for correction, and follow up to insure they are eliminated.

If you have the opportunity to serve in the safety field in the future, I guarantee that you will be faced with many challenges. I also guarantee that your ability will be continually tested in the resolution of those challenges.



The Radio Altimeter

or they don't call it "Absolute Altitude" for nothing.

Capt Jim H. Evans
46 ARS K. I. Sawer AFB

An EC-135 starts its takeoff on a dark night from a southwestern base and, in a matter of moments, becomes a mass of flaming junk because its crew continued straight ahead into an area whose terrain climbed faster than the aircraft could. During an enroute descent to a nearby, but unfamiliar base, a KC-135 descends below its assigned altitude and writes a tragic ending to what should have been a "milk-run" flight. While there are other factors involved in these accidents, one common denominator is a disregard, or unawareness, of "absolute altitude."

During the critical eleven minutes of flight, when the aircraft is making a takeoff or a landing, the absolute altitude of the aircraft is the crucial difference between flying and scraping across the ground. As we all know from AFM 51-37, the absolute altitude of the aircraft is the height of the aircraft above the terrain directly beneath it. It is as certain as inflation and taxes that, when the absolute altitude equals zero, either a landing or a crash will result. Some of you "tanker types" may be thinking it would be handy if we had a direct cockpit read out of this very critical altitude above the terrain.

The AI-101 radio altimeter, which is a component of our FD-109(V)/RGA system in the tanker, is just such an absolute altitude indicator. The pointer on the radio altimeter reads airplane altitude above the terrain from 2,500 feet above the terrain to 20 feet *below* the terrain. The latter serves little useful purpose since a like indication during a mission would probably be preceded by ground impact. The movable minimum decision altitude (MDA) index can be used to determine at what altitude the MDA warning will illuminate to indicate ground proximity.

There it sits in the center of the dashboard, just to the left of the main FD-109 instrument cluster, yet it is probably one of the least used instruments we have. If you think of the radio altimeter as a subtle ground proximity warning system (GPWS) without the whooping noises and voices shouting "PULL UP" or "GLIDE PATH," we can use the MDA light as a quiet reminder that a significant altitude has been reached and it can assist the pilot by serving as a memory aid or cue as to his position in relation to unyielding terra firma.

TAKEOFF AND CLIMB

Sure, you can use the radio altimeter as a takeoff instrument aid. It can serve as a reminder that an appropriate clean-up or maximum flaps down height above the runway has been reached. It can also warn that the ground has not fallen away from the aircraft as rapidly as the pilot thinks it has.

On an accelerated-climb (AC-CL) mode takeoff, the pilot flying the aircraft can set his MDA index to 200 feet to remind him when this minimum altitude for flap retraction has been passed. When the light goes out, the only additional requirement for flap retraction will be the appropriate minimum airspeed. The other pilot can set his MDA index to 1,000 feet for a dry takeoff or the maximum flaps down height above unstick for a wet thrust takeoff. In this way, the minimum altitude for flap retraction and the maximum altitude to begin the acceleration to enroute climb speed are both presented to the pilots.

During a maximum climb (MAX) mode takeoff, the pilot flying the aircraft can set his MDA index to 1,000 feet for a dry thrust takeoff or the 3-engine clean-up height above unstick for a wet takeoff. The other pilot can set his MDA index to the 4-engine clean-up height above unstick for a wet takeoff or 1,000 feet for a dry takeoff. In this way, the pilot flying the aircraft can be reminded, by the extinguishing of the MDA light, that it is time to decrease the climb rate and begin the acceleration to flap retraction and enroute climb speeds.

In any case, the illumination of the MDA light is a reminder to the pilots that they are close to the ground. When it goes out, it is a reminder that a critical height above the terrain has been passed and appropriate action to decrease climb rate, retract flaps, or accelerate to enroute climb speed can be taken. If the light stays on, you had better do something about it since it indicates that the ground is staying uncomfortably close to your fragile air machine.

Approaching the appropriate transition altitude, of course, set the radio altimeter MDA index to 2,000 feet in accordance with the Flight Manual so that it will serve as a reminder on subsequent descents that you are, once again, getting close to the ground.

DESCENT AND INSTRUMENT APPROACHES

The use of the radio altimeter and procedures of altitude awareness are specified in the Flight Manual for descent to decision height (DH) or minimum descent altitude (MDA). *The Dash One notes that the radio altimeter should not be used as the primary DH or MDA indication, except for published radio altimeter approaches.* It specifies, however, that the pilot flying the approach will set his MDA index to the height above touchdown (HAT) or height above airport (HAA) for the approach to be flown. The other pilot keeps 2,000 feet set in his radio altimeter on initial penetration until the MDA light illuminates. He then notifies the crew "Passing 2,000 feet AGL" and resets his MDA index to 100 feet above the HAT or HAA to remind himself and the pilot flying the approach that the DH or MDA for the approach is being approached.

The Flight Manual is strangely silent concerning crew coordination or altitude awareness procedures after DH or MDA have been reached and the decision to land has been made. We cannot stop flying the aircraft just because we have successfully reached decision height, however. The flight does not end until the engines are shutdown and the chocks installed.

A recent National Transportation Safety Board study of "Flightcrew Coordination Procedures in Air Carrier Instrument Landing System Approach Accidents" emphasizes the importance of insuring that a systematic scan of aircraft flight instruments is maintained by one of the pilots from the final approach fix to touchdown, especially in a low visibility environment. The pilot not flying the aircraft must maintain an instrument cross-check and advise the pilot performing the landing of deviations from desired flight parameters. The radio altimeter can serve as a useful aid in low visibility approaches and landings.

Some guidelines for approach management, altitude awareness, and descent rate control training are contained in FAA Handbook 8430.6A, "Air Carrier Operations Inspector's Handbook." While these procedures are not mandatory for military -135 aircraft, we may be able to learn a few tricks from the 707 drivers.

Among the items recommended for inclusion in airline flightcrew coordination procedures are acceptable rates of descent, altitude callouts at 1,000 feet above field elevation, 100 feet above DH/MDA, the DH/MDA, deviations from course centerline and glideslope, approach light or runway light sightings, and callouts at 10 foot increments from 50 feet on the radio altimeter to touchdown. Some carriers also require that the pilot flying the aircraft be notified whenever the descent rate exceeds 500 FPM below 100 feet on the radio altimeter. The objective of these required callouts is to insure that a landing approach is, insofar as possible, stabilized with a proper rate of descent, proper airspeed, and accurate tracking of course and glideslope information.

Continued on page 22

SEVERE WIND SHEAR

The following is an adaptation of a National Transportation Safety Board mishap report and information release. Ed.

The aircraft's encounter with severe wind shears near the ground — the result of the pilot's continued approach "into a clearly marginal severe weather condition" — caused an airliner to crash, the National Transportation Safety Board reported recently.

Mishap Sequence

At 1702, the crew contacted approach control, advised that the flight was descending to 5000 feet and stated that they had ATIS "Oscar," which read in part "three thousand scattered, twenty-five thousand scattered clouds, visibility 6 miles, haze, temperature 91°, wind two six zero degrees at ten knots, altimeter three zero one six." Approach control advised the crew to maintain 5000 feet and that the approach in use was the ILS to runway 27R. Subsequently, they were directed to intercept the

localizer course on their present heading and proceed inbound for an ILS approach to runway 27R. The computed approach speed for the landing was 122 KIAS.

At 1705, approach control advised that another flight had reported that the visibility "just went to 2 miles." According to the cockpit voice recorder (CVR) the pilot remarked, "Two miles." A few seconds later he said, "Part of that storm sitting on the end of the runway." The copilot replied, "Yeah." The pilot testified that he remembered seeing a small cell on radar as they approached the airport. The copilot also saw a single cell and said that it was a few miles west of the airport. The pilot described it as not being much of a cell and the radar showed no heavy precipitation. However, the copilot later stated that it contoured on the aircraft's weather radar. Because of his distance from the airport and the cell's distance from the airport, the pilot believed that they would be able to land before the cell arrived over the airport.

At 1706, when about 15 miles from the threshold of runway 27R, the aircraft intercepted the localizer course, the leading edge slats were extended, and the landing gear was lowered.

. . . he realized that he had previously miscalculated how fast the storm was moving.

At 1707:50, the approach controller cleared the flight to the tower frequency. At 1708, the flight called the tower, but the tower controller did not acknowledge the transmission. At that time another aircraft was attempting to land on runway 27R.

Because rain obstructed his view from the tower, the controller asked the crew ". . . are you on the runway, sir?" The response was that they were ". . . going around," and the tower acknowledged. According to the CVR the crew commented on these transmissions by asking, "How come he went around?" and by saying, "Yeah, he probably got a wind — got a wind change."

At 1708:40, the crew overflew the outer marker (OM) and reported this to the tower. Less than a minute later, the copilot said that he could see the runway and that the flaps were extended to 50° — the landing configuration. The pilot testified that after passing the OM he realized that he had previously miscalculated how fast the storm was moving. He stated that he could see that it was raining quite heavily on the opposite end of the airport, and that he did not like, "the looks of this mean looking cloud mass . . ." approaching his touchdown point.

At 1710, the tower cleared the flight to land and reported that the wind was from 230° at 25 knots. The crew acknowledged and the pilot commented, "twenty-five, huh?" The copilot replied, "yeah, two-thirty at twenty-five."

At 1711:17, 400 feet was called. Three seconds later, the tower told another aircraft that the surface wind was 210° at 35 knots. (Based on that wind, the crosswind component for runway 27R was 30 knots.) At 1711:23, the pilot said, "Thirty-five, let's go around." He later stated that his decision to go around was based on the appearance of the storm and that he made the decision to go around before the wind shift call from the tower. He said, "I was on the verge of going right there, just by looking at the thing. And when the tower gave me this wind shift; that's enough for me, I'm leaving."

The pilot said that he applied power and simultaneously activated the speed command system to the go around mode by pressing the palm switch on the power levers. He then rotated to the go-around attitude dictated by the command bars displayed on the flight director instrument and called for 15° flaps. The copilot then moved the flap handle while he "got on the power" and advised the tower that they were going around. The crew testified that the landing gear was retracted when the aircraft started to climb.

The pilot said that after gear retraction, the indicated airspeed had dropped to 4 or 5 KIAS below Vref. (Go-around airspeed and takeoff safety speed (V2) were 132 KIAS.) He said that the flight director's command bar on his attitude indicator began to drift downward from about 14° nose up to about 10° or 12° nose up, and he decreased the pitch of the aircraft to match the flight director's command bars. He also noted that the vertical speed indicator was indicating a descent. He stated that he maintained the attitude dictated by the command bars until ground impact and that he did not think of increasing aircraft's pitch angle above that indicated by the command bars because the airspeed was "too low."

The copilot confirmed the pilot's description of the sequence of events. He said he heard the ground proximity warning and called "pull up" several times. Both pilots said that they checked the engine power settings and that they thought the indicated power was ample for the go-around. The copilot testified that he recalled that the actual setting was .05 to .06 engine pressure ratio (EPR) below the preselected setting for takeoff at their last destination which was 1.92 EPR. Except for the airspeed drop below Vref, neither pilot could recall any indicated airspeeds or altitudes after initiating the go-around.

Another air carrier flight was holding on a taxiway facing toward runway 27R. Its pilot said that the rain was heavy and that he first saw the aircraft when it emerged from the rain at 75 to 125 feet above the ground. He said that the aircraft was making a go-around; the landing gear was up, the wings were level, and it had about a 10° nose up attitude. He further stated that the aircraft appeared to stop flying, descended to the ground with the nose up, struck the ground to the right of runway 27R, and then slid along the ground — passing in front of his aircraft before it came to rest.

. . . he heard the ground proximity warning and called "pull up" . . .

The tower controllers first saw the aircraft when it emerged from heavy rain slightly to the right of runway 27R near the intersection of two taxiways. The aircraft was headed west about 100 feet above the ground and was descending in a slight nose up attitude with the wings level and the landing gear retracted. The controllers said that the airplane hit the ground near runway 27R. The tail section separated from the aircraft shortly after impact. Passengers began to evacuate the aircraft immediately. There was no fire. Eighty-seven of the 106 persons on board were injured, but there were no fatalities.

Meteorological Information

A thunderstorm was in progress. Before the mishap, the last official weather observation was completed at 1708. The observation was as follows:

> Special: Ceiling estimated 2,500 ft broken, 8,000 ft broken, visibility — 1 mile, thunderstorm, moderate rain-showers, wind 240° at 17 kts, gusts to 41 kts, altimeter setting — 30.19 ins., thunderstorm began at 1703, overhead, moving east-northeast, runway 9's runway visual range (RVR)

— 1,000 ft variable to more than 6,000 ft.

The graph of transmissivity for runway 27R and the RVR — Transmission Conversion Table disclosed that the RVR dropped below 4,000 ft about 1705, increased to almost 4,000 ft about 1707, and then immediately dropped below 4,000 ft again. The RVR continued to drop rapidly to a low of less than 1,000 ft about 1709, began to increase, and reached 4,000 ft at 1716.

The digital displays have a visual warning system (amber light) and an audible alarm system (bell) to alert the controllers if the RVR goes below a preset value. The controller may insert the RVR value he wishes monitored. The operation of the system is controlled by an on-off switch. When switched "on" the amber light will illuminate if the RVR goes below the preset value and will remain lit while it remains below that value. The alarm bell will sound a single stroke every time the readout updates if the new value is below the preset value. At the time of the mishap there were no procedures to establish when the alerting system should be used. None of the controllers could recall observing an RVR below 4,000 ft; consequently, none of the aircraft arriving while the RVR was below minimums was informed of this fact.

The maximum wind speed recorded was 41 kts at 1708. At 1712, the wind speed was 36 kts. The direction of the wind was from the west from 1701 to 1705, from the southwest from 1706 to 1712, from the north from 1716 to 1717, from the northeast from 1718 to 1721, and from the east from 1722 to 1733.

The rainfall weighing gauge showed 0.35 in. of rainfall from 1650 to 1742. The rainfall was reported as light rainshowers at 1650 which continued until 1704 when they were reported as moderate. The rainshowers continued to be reported as moderate until 1720, when they were reported as light again, and remained light until the rain stopped at 1742. However, the rainfall graph showed that between 1704 and 1720, the rainfall should have been reported as heavy.

Although the approach control radar was functioning normally, the precipitation associated with the storm over the airport was not being depicted. The approach control radar is located on the airport and is used primarily for separating aircraft. The approach controller cannot see outside from his station.

The copilot stated that as they entered the area they had a storm cell on their radar. The radar was set on the 30 nm range, and the cell "appeared to be just west of the airport by a couple of miles, perhaps. That is a rough estimate . . ." The cell contoured on the radar. He said the cell was circular and about 7 miles in diameter. The contour within the cell was circular, and he estimated it was "a quarter of the size of the whole storm."

Conclusions

The Board concluded that "the weather-related information available to the crew throughout the approach provided sufficient data for them to assess the storm's position, to anticipate the presence of a potentially severe low level wind shear, and sufficient time for them to avoid penetrating it at a low altitude."

The Board could not determine the exact magnitude of the horizontal and vertical wind components of the shear the aircraft encountered, but said weather reports, post-mishap performance studies and flight simulation indicated it was "severe."

The Board found that runway visual range (RVR) readings on the tower display had dropped below minimums two and one-half minutes before the flight passed the Runway 27 outer marker. But the FAA controller did not make the required report to arriving aircraft.

. . . the aircraft appeared to stop flying and descended to the ground with the nose up.

Had the crew received such a report before reaching the outer marker, they would have been required by regulation to abandon their approach. And even after they had passed the outer marker, the below-minimum RVR, indicating heavier rainfall, would have given the crew more information with which to assess the storm's severity, the Board said.

The Safety Board concluded that the approach should have been abandoned at or shortly past the outer marker, and that the crew should have done this "before they were in a position that required the missed approach to be conducted within the storm."

The Safety Board's official finding of cause was "the aircraft's encounter with severe horizontal and vertical wind shears near the ground as a result of the pilot's continued approach into a clearly marginal severe weather condition. The aircraft's ability to cope under these conditions was borderline when flown according to standard operating procedures; however, if the aircraft's full aerodynamic and power capability had been used, the wind shear could probably have been flown through successfully. Contributing to the mishap was the tower controller's failure to provide timely below-minimum RVR information."

WHAT I LEARNED FROM PAMELA

Capt Harold F. Fontaine
905 AREFS, Grand Forks AFB

As I walked out of the monthly flying safety meeting, I overheard a couple of fellow crewmembers commenting on the spring and summer weather hazard briefing we had just received. It seems they thought the timeliness of the briefing was wrong. I thought about their comments and suddenly realized that I had felt the same way after last year's briefing. Sure, we still had snow on the ground and summer was a few months away, but they were missing the big picture, as I had done last year. Since we fly all over the world we can encounter any possible weather hazard at almost anytime of the year. This point was vividly brought home to me last summer.

My crew was selected for a short TDY in Guam. We were really looking forward to the trip as an opportunity to break the routine of local area training missions. Arriving in Guam, we quickly got into the swing of things: mission planning, refueling B-52's, and pulling strip alert. However, something was about to happen that would have a lasting impact on me for the rest of my flying career.

Typhoon Pamela was developing in the vicinity of Truk Island located in the Caroline Islands. As Pamela churned around Truk, she gathered strength and devastated the island as well as taking the lives of ten people. Pamela, now a "killer" typhoon, was moving on; in which direction no one was certain. Initially, the weather experts thought Pamela would pass 2 or 3 hundred miles south of Guam.

Suddenly, Pamela changed direction and headed straight for Guam with winds greater than 150 mph. Now, my previous lack of concern about Pamela was gone, and I wished that I had listened closer to what the weather officer had briefed two months before. It sure seemed like he had talked about typhoons, but I just could not remember all the little details. Well, it was too late now, because we were getting involved in a mass evacuation of Guam.

We were the first KC-135 to depart for Kadena where we were programmed to sit out the storm. Once airborne, I felt relieved knowing that I would be miles away from the storm and would have nothing to worry about.

For three days Pamela pounded Guam before the 20 mile eye of the storm passed directly over the island. At passage, the lowest pressure measured was 936 millebars/27.64 inches of mercury; this was more than two inches below normal pressure for Guam. The exact ferocity of Pamela's winds could not be measured, because the measuring devices at the weather warning center were blown away and those located at Andersen AFB broke when the winds reached 170 mph. According to the word we received at Okinawa, the authorities estimated the peak winds on Guam were at least 190 mph.

Rainfall was also extensive; the experts estimated that 20 inches of rain fell during the typhoon. The exact rainfall was impossible to measure, because the strong winds did not allow the rain to gather in a gauge.

As the eye of the storm passed, the winds, which had calmed inside the eye, suddenly returned to 90 mph or more. This sudden increase in winds had an extremely damaging effect on the already weakened structures. Houses were torn apart and the roofs of sturdier buildings were blown off with explosive force. The destruction was reminiscent of World War II days, except this time it was the force of nature, rather than man, that caused the damage.

By the time Pamela passed, 75 percent of the island's 100,000 population had to be evacuated to higher ground, and only 25 percent of the island still had electrical power. The island's agriculture was completely destroyed. Thirty thousand people were left homeless and damage to our military installations amounted to several million dollars. The people faced a massive clean up and rebuilding operation. The President quickly declared Guam a disaster area and approved federal funds for relief and clean up operations.

My crew was chosen to fly the first relief mission into Guam. On board was a "Prime Beef" relief team consisting of maintenance, civil engineering, and other base support personnel. We also carried food and other supplies which were desperately needed by the people on Guam.

Before departing Kadena, we received a weather briefing which indicated the storm would be well north of our intended track. We were about halfway to Guam when we discovered that Pamela had stalled in our flight path. Now I was really trying to recall all the weather officer had told us about penetrating a typhoon area.

We started picking our way through without doppler (the radar was operable). Reliable positioning was obtained by recording heading and airspeed information and then deriving an airplot dead reckoning final position. The boom operator worked the ASN-7 computer with artificial winds enabling us to keep a running position on a GNC chart. Finally, through sheer determination, experience, combined knowledge and crew coordination, we managed to get through the storm area. We had spent over one and a half hours altering our heading during this penetration and we were exhausted. When we were able to get a radar fix on Guam, we found that our dead reckoning position was only 7 miles in error.

Since all of the navigation aids on Guam were destroyed or useless, our approach was strictly VFR. In addition, we found that the runway lights were inoperative. After flying a low approach to check the runway condition, we were cleared to land. The landing was like a Vietnam assault landing, but we made it. We were met by personnel who had been working around the clock without sleep since the storm had hit. The place looked exactly like we had heard. Trees were stripped bare, houses were missing from their foundations, the few buildings still standing were leaning, and power lines and debris were everywhere. It was a real mess. The relief team we brought in was a welcome sight to the people cleaning up the mess.

We were put on alert to provide med-evac or refueling support as required. While sitting on alert, I had time to reflect on what had happened enroute to Guam from Kadena. Nobody could realize the apprehension I felt as we entered the typhoon area. So I decided I needed to learn more about typhoons and AFM 51-12 provided a wealth of information.

As I thumbed through AFM 51-12, I noted several pertinent facts. In weather terminology, a typhoon is a tropical cyclone; a “closed” surface low pressure system originating mostly between the 5 and 15 degree latitudes. In a closed system, the pressure is lower in the center of the system than at any other point in the horizontal plane. The cyclone becomes a typhoon when the winds reach a velocity of 65 knots or greater. Winds have been recorded as high as 180 knots. and the diameter of the storms have exceeded 1,000 miles. The storm’s destructive winds can cover an area as wide as 500 miles. AFM 51-12 states that the most intense part of the storm is the right front quarter and the weakest portion is the left rear quarter. Therefore, when flight through a typhoon area is required seek the weakest area. It also states that you are to avoid flying through the “wall cloud” of the eye; this is the destructive wall of wind that follows the passing of the eye.

If a flight through a tropical storm area must be conducted, it should be done at an altitude above FL 300, where the winds are not as strong. Another problem to lookout for is the turbulence encountered in this type of storm. The roughest areas are located at the “spiral rain band”, particularly after the storm turns to the north or east and enters the extra-tropical region. Considering these facts, if you cannot avoid the storm area, the safest course is to by-pass the storm center to the right maintaining a tailwind component.

Well, we made it through the experience unscathed, with memories that will remain vivid for years to come. The next time war stories are swapped, I can now join in and tell about my experience.

HELP WANTED: Looking for a unique assignment? The only squadron in the world flying the Lockheed U-2 is the 99th Strategic Reconnaissance Squadron, at Beale AFB, CA. The 99th is presently in need of experienced pilots who enjoy flying alone and can think for themselves. The U-2 is a relatively uncomplicated aircraft and is therefore “flown” rather than simply programmed and monitored. You’ll find that flying the U-2 is a demanding job. The long recon sorties are flown in a pressure suit and at maximum performance. Even landing the “U-Bird” challenges the most experienced pilots. You carry the responsibility and you’ll make the decisions. Being extremely cost effective, this aircraft is continually tasked against a wide variety of missions; including photo recon, atmosphere research and systems development. Operational missions are flown from Beale and operating locations around the world.

Still interested? If you have 18 months as a pilot in command in one or more aircraft and 1500 hours flying time (or, 1350 hours total with 1000 as FP/IP), contact the U-2 Manning Section of the 99th SRS, 9th SRW, Beale AFB, CA, AV 368-2156/2927.

MISSILE MISHAPS

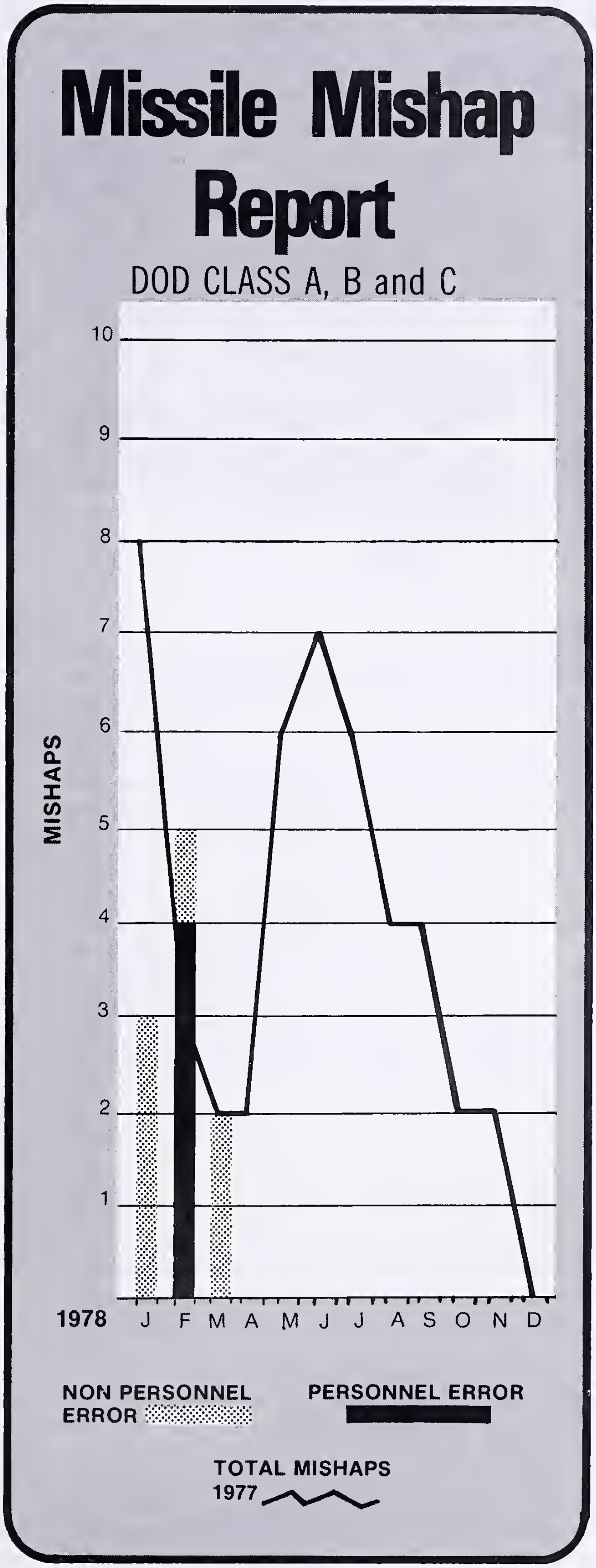
MINUTEMAN

A maintenance team removed and replaced the A5A1 resistor board on the ordnance relay panel assembly in the distribution box. When power was applied, the board shorted, causing damage to the board and associated wiring and connectors.

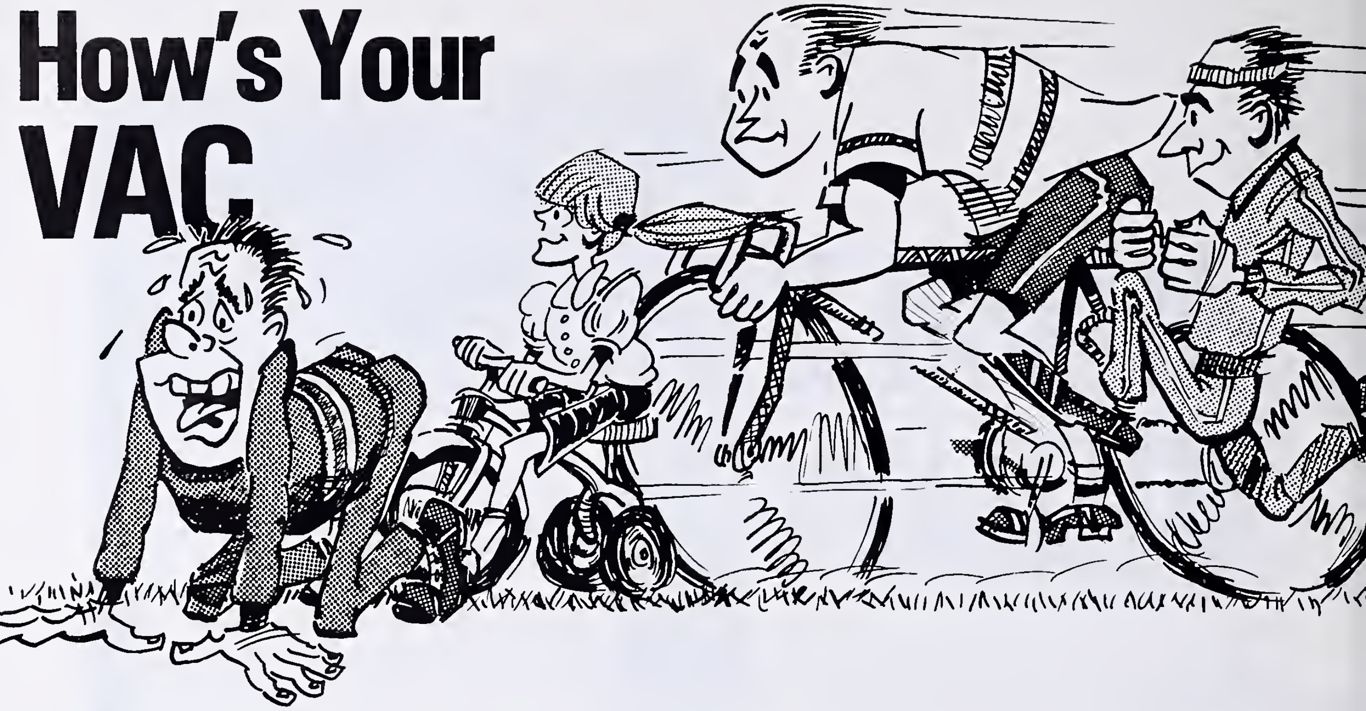
Examination of the A5A1 resistor board after the mishap revealed that terminal boards two and seven were reversed. The damaged resistor board was received from supply in this configuration, as was another replacement board. This reversal permits the battery current to flow through the board, shorting it to ground, causing damage to wiring and connectors. A Category I deficiency report was submitted on both A5A1 boards.

SRAM

During the post download inspection, damage to the 180-degree fin was discovered on the missile in the pylon number one position. The cause of the damage is attributed to an unknown object striking the leading edge of the 180-degree fin. Missile fins are often in close proximity to objects during uploads and downloads. Therefore, it is imperative that additional emphasis be placed on clearances during all handling operations.



How's Your VAC



How's my what?

The many different names that doctors and scientists use to discuss hardening of the arteries are confusing to the average person. A physician may use the phrase "coronary heart disease" or may say that the patient is suffering from "coronary artery disease." In discussing a patient's case with another doctor, they may use phrases such as "arteriosclerosis heart disease" or "ischemic heart disease."

The general scientific name for a number of diseases of the arteries, including hardening of the arteries, is arteriosclerosis. **Atherosclerosis is the most common form of arteriosclerosis. It affects the larger arteries of the body and is a condition in which the inner layer of the artery wall is thickened and irregular with many deposits of fatty substances on the interior of the artery.**

Hardening of the arteries is a major health problem in the United States. It has been on the increase in recent decades, and it is a disease which strikes young people as well as the older people. **Scientific evidence gathered over the years indicates that there are many complex and interwoven factors involved in the disease, not the least of which is the American way of life — a high calorie diet with an abundance of fats, too little exercise, and heavy cigarette smoking.**

ARTERIES AND THEIR ROLE

The body's circulatory system — a physician would say cardiovascular system — is made up of the heart and the arteries, capillaries, and veins. The heart contracts about 70 times each minute, day and night, pumping oxygen- and food-rich blood into all regions of the body to nourish the muscles and tissues.

Arteries form the pathways the blood uses as it travels away from the heart and throughout the body.

Capillaries are the minute tubes where the oxygen and food in the blood are passed out to the body tissues and where carbon dioxide and waste products are admitted from the tissues into the blood stream.

The veins carry this used blood back to the heart.

Veins and capillaries are not affected to any significant extent by the disease process which hardens the arteries.

For some reason still not clearly understood by the medical profession, fatlike substances build up on the inside walls of the arteries. Gradually they accumulate and form thick deposits called "plaques." **These deposits both roughen the artery's normally smooth inner lining and narrow the channel for blood flow, making it more difficult for enough blood to get through.**

Making matters worse, the artery loses elasticity with age and also loses its flexibility.

Every artery throughout the body is subject to hardening, but the most often and most seriously affected vessels are the largest arteries, such as the aorta, the coronary arteries, and the arteries that feed the brain and kidneys. Scientists believe that some, but probably not all, of the fatty substances that build up on the artery wall come from the blood fats.

***Veins, arteries and capillaries**

But just what starts the process of hardening of the arteries is not known.

More than half of all the deaths from the various kinds of heart disease are the consequence of hardening of the arteries. It is the culprit behind several of the most familiar afflictions of the cardiovascular system.

For example, hardening of the arteries sets the stage for many "strokes" by clogging arteries carrying blood to the brain. The damaged artery or arteries may be located either inside the brain itself or in the neck.

When kidney arteries harden, one type of hypertension — high blood pressure — may develop. In turn, hypertension may aggravate hardening of the arteries in other parts of the body.

Hardening of the leg arteries may cause off-and-on weakness and pain in the legs when taking a walk. These symptoms grow worse until walking is no longer possible, but they disappear after a period of rest.

Another site of hardening, and by far the most frequent troublespot, is the "coronary arteries," the network of vessels that bring the heart muscle its own blood supply. Gradual reduction in blood flow in a coronary artery due to hardening may cause heart pain, known as "angina pectoris." When more drastic or sudden restriction in the flow of food- and oxygen-laden blood occurs anywhere in the coronary artery network, starving a part of the heart muscle, a "heart attack" may result.

Often this is precipitated by formation of a clot at an area affected by hardening.

ANGINA PECTORIS: The human heart has great strength and works constantly, 24 hours a day. Even when fatty deposits have narrowed one or more of the coronary arteries, the blood supply reaching the heart muscle may still be adequate to fill the need for food and oxygen which this steady workload imposes.

These same arteries, however, may not be capable of furnishing the extra blood the heart demands when a person exerts himself more than usual, such as in dashing to catch a bus, or when he becomes overexcited by some especially good or bad news.

At such times "angina" may be felt in the chest. This severe pain, often accompanied by a sense of pressure or suffocation under the breastbone, normally subsides within a few minutes after the added exertion is over. Angina sometimes extends into the left shoulder, arm, and hand.

Angina pectoris is not a disease itself, but a symptom of a disease. The words "angina pectoris" literally mean pain of the chest. Such chest pains may also be the result of many conditions other than an insufficient flow of blood to the heart muscle. **But, such episodes of pain, especially if they recur, should always be reported to a physician who will be able to make a diagnosis.**

HEART ATTACK: More serious trouble arrives when hardening of the coronary arteries has gone far enough to cause a "heart attack."

Such an attack can occur primarily in two ways

- **Blood fighting its way through a narrowed and roughened coronary artery may form a clot that seals off the channel,** halting further blood flow through that vessel and all of its "downstream" branches. With its source of life cut off, that segment of heart muscle normally fed by the blocked artery will die. Doctors call a heart attack occuring in this way a "coronary thrombosis." This most common type of attack can happen during sleep as well as during normal daily activity or in the midst of stressful or exciting activity.
- **In the second type of heart attack, the fatty deposits themselves plug the vessel, without the help of a clot.** The deposits simply become so greatly enlarged that they merge and shut off the flow of blood.

An attack occurring in either way may be so mild that the victim does not notice it (although this is most uncommon), or it could be so severe as to bring sudden death. How serious it is depends on the size of the blocked vessel and the extent of the heart muscle area damaged by blood starvation. **This damaged or killed region of heart muscle is called a "myocardial infarct."**

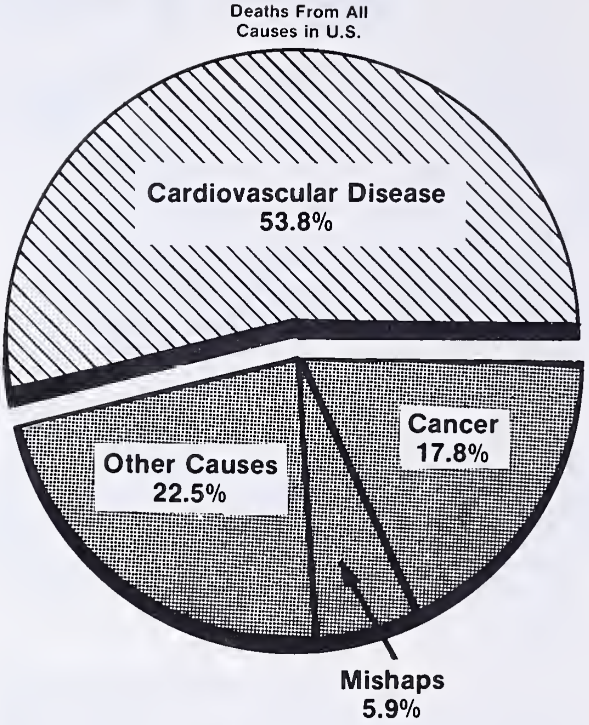
The excruciating pain of a heart attack may last for several days. Other symptoms are usually an intense shortness of breath and heavy perspiration. Occasionally the person suffering a heart attack also loses consciousness.

During the period of recovery, a scar will form where the heart muscle has been damaged. The important thing that a patient must remember in getting over an attack is to get plenty of rest and to follow the physician's treatment plan. The repair going on in the heart is like the knitting of a broken bone — it takes time.

When recovery is complete, a rule of moderation in all things is required — no overworking, no overeating, no extremes of any kind.

And, if the heart attack victim is willing to follow a pattern of proper care and the physician's advice, chances are very good for many more years of enjoyable living.

Some heart attacks never happen. The body has its own remarkable way of averting disaster even though the coronary arteries have started to harden. It is called "collateral circulation." In it, neighboring arteries carry more blood than formerly to compensate for a narrowed vessel and new arterial branches open up to help transport blood where it is needed. This partly explains why many people even



with severe hardening of the coronary arteries do not suffer heart attack and why some do not even experience the pains of angina pectoris.

Collateral circulation can also be of vital importance after a heart attack has struck. It may keep the victim alive in the first few hours after the attack, then assist the heart in repairing itself and regaining its strength.

Scientists have recently developed a mechanical pump, called a counterpulsator, that can be used to speed the opening of this collateral vessel network in heart attack victims.

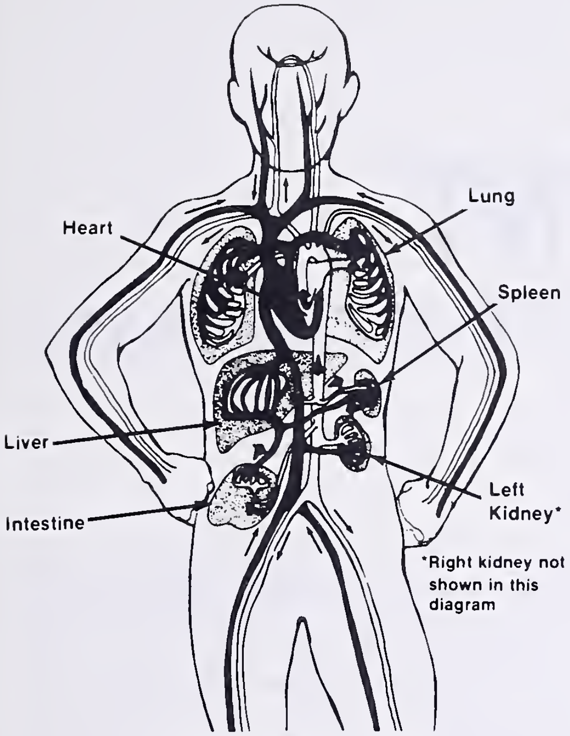
IMPORTANT FACTORS TO THINK ABOUT

Studies indicate that many things influence the development of hardening of the arteries. Unlike some illnesses, this one is not the result of a single identifiable cause.

What all the factors are, how important each individual factor is, and how each contributes over a long period of time to hardened arteries — and the troubles such as heart attack and stroke that result — are still being studied.

The factors are:

- **Age: The bulk of heart attacks from hardening of the arteries occurs in the middle and later years of life.** While nothing can be done to keep individuals from growing older, scientists are seeking knowledge that will enable them to reduce the high number of heart attacks suffered by middle-aged men and to halt the threat toward big heart attack tolls in younger age groups as well.
- **Sex: Women — apparently just because they are women — have an advantage over men in respect to the risks of getting hardening of the arteries and having heart attacks.** Symptoms of hardening of the arteries show up in women 10 to 20 years later than in men, and women generally have less serious forms of the trouble. Medical research has attributed the years of extra protection to the female sex hormones, called "estrogens." As their estrogen production diminishes during menopause, women begin to have more heart attacks, although these heart attacks continue to be milder than those striking husbands or brothers. Scientists have given the estrogens to men to test this as a potential means of shielding men from so many heart attacks, but undesirable side effects result.
- **Heredity:** Another factor over which a person or the physician has no control, besides age and sex, is heredity. If a person's family history includes a record of frequent heart trouble, however, he can and should give extra attention to other factors about which something possibly can be done.
- **Cholesterol: There is scientific evidence that the more of the fatty substance cholesterol a person has in his blood, the greater are his chances of hardening of the arteries going far enough to cause a heart attack or some other cardiovascular affliction.** Indeed, to date it seems that the primary factor in causing hardened arteries may be a failure of the body's metabolism of fatty materials — that is, the way the body regulates the blood concentration of cholesterol and related substances. But whether or not cholesterol — found in most animal fats we eat, as well as manufactured within the body itself — is the guilty party or even the "most guilty" has still not been proved. Persons with normal amounts of cholesterol in their blood sometimes develop hardening of the arteries, too. Some other factor or condition, as yet unrecognized as the real culprit, may therefore be responsible both for the large amounts of cholesterol in the blood and for the sequence of events that hardens arteries and leads to heart at-



Human Cardiovascular System

tacks. High blood concentrations of other fats — the "neutral" fats or triglycerides — also seem to entail greater risks from hardening of the arteries.

• **Diet: In general, diets high in fat content, especially animal and dairy fats, tend to raise the level of cholesterol in the blood.** Many doctors and scientists feel that dietary changes which reduce the total intake of fat and substitute polyunsaturated fats for animal and dairy fats can have a beneficial effect. What changes in a person's diet might be helpful, not harmful, must be decided in each individual case by a physician. Dietary modifications should always and only be undertaken with medical supervision.

• **High Blood Pressure: Hypertension, or high blood pressure, accelerates hardening of the arteries, and vice versa. The higher an individual's blood pressure goes, and the longer it remains elevated, the greater is the risk of suffering a heart attack.** Most cases of high blood pressure, even severe cases, can be effectively treated today with modern drugs.

• **Cigarette Smoking:** A man who smokes cigarettes is twice as likely to have a heart attack as a nonsmoker. **Although so far there is no proof of how smoking is related to heart attacks, or the hardened arteries that underlie the attack, it is known that the person who stops smoking cigarettes greatly reduces his or her attack risk.** This is true no matter how long he or she has been smoking. On the other hand, the more cigarettes a person smokes, the greater the chances of suffering a heart attack.

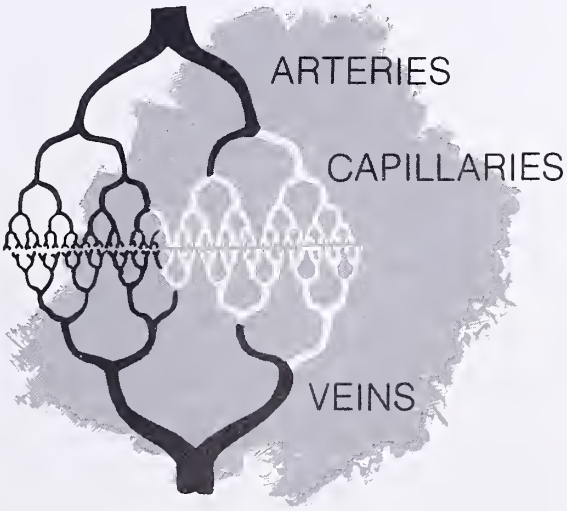
• **Other Factors:** There are other factors that may be involved also in causing hardening of the arteries and other heart disease. They are —

—**Obesity:** This often contributes to high blood pressure and may or may not make a significant contribution by itself to the development of heart troubles including hardening of the arteries. Excess weight is never good for a person's health, and fortunately, something usually can be done about it,

—**Stress and Strain:** Stress and strain, especially of an emotional nature or for prolonged periods of time, may play a part in some heart attacks. Many medical professionals however think that the role of such pressures probably becomes important only after already hardened arteries have created the setting for an attack,

—**Physical Activity:** Any kind of activity — work or play — on a regular basis is recognized as good for most people and an important part of any lifelong formula for the best heart health,

—**Environmental Conditions:** These conditions — air pollution, climate, altitude, and others — are under some suspicion. They are undergoing scientific scrutiny to determine the effect of these and other facets of our living habitat on the development of heart disease and other illnesses.



THE FUTURE

Within the past two years, deaths from the Nation's number one killer — coronary heart disease — have shown a slight decline.

With further research, this downward trend may be accelerated in the future.

While not every factor considered to be contributing to hardening of the arteries can be avoided, those that can be, should be.

BIG INSTRUMENT

CREW PROCEDURES TEST PROGRAM

Major Donald F. Allan
Captain Dennis D. Carpenter
1CEVG, Barksdale AFB

During the past few years, there has been an increase in SAC aircraft mishaps occurring during the takeoff and descent/landing phases of flight. As a result of the concern generated by these mishaps, a conference was convened at the Instrument Flight Center, Randolph Air Force Base, in August 1977. The purpose of this conference was to discuss descent and approach procedures and determine if current SAC aircrew procedures and techniques could be made more efficient and effective while operating in what has become known as the "Critical Eleven Minutes." Representatives to the conference included SAC, MAC, ATC, and two civil air carriers. As a result of the ideas generated at this conference, 1 CEVG developed a list of procedures to be tested by SAC aircrews. In October 1977, 1 CEVG and Castle Air Force Base CFIC began a flight test program to determine initial reaction to the procedures that had been developed. In November, the flight test results were evaluated and, while some of the procedures appeared to work well, others were in need of modification. After the recommended changes were incorporated, the procedures were presented to the flight crews of the 2d Bombardment Wing, Barksdale Air Force Base, for flight testing. Crews were asked to study and "table fly" the procedures thoroughly prior to using them in flight. They were asked to make specific comments on how each procedure affected crew pacing, and the applicability of each procedure to their aircraft.

The 2d Bombardment Wing test program was completed on 17 February 1978. An analysis of the test critiques indicated a general agreement among crew members on the validity and applicability of several of the procedures tested. These procedures will be incorporated in SAC flight manuals and flying regulations in the near future. The remaining test procedures, because of the amount of conflicting and sometimes negative comments received, are not being recommended for adoption as procedures. However, they are presented in this article, not as suggested procedures, but for consideration as individual aircrew techniques. Crews should evaluate each technique for merit. If a crew feels that any particular technique is confusing or ambiguous, disregard it. If any technique appeals to an aircrew, feel free to modify it to a standard that is most beneficial to individual needs.

The test procedures will be presented as they were to the 2d Bombardment Wing flight crews followed by typical comments and a synopsis of the purpose of each procedure.

TECHNIQUE: The pilot or copilot will announce over interphone crossing a published final approach fix with MSL altitude: "Final approach fix 1900 feet." Other aircrew members will crosscheck aircraft position and altitude called. If position and/or altitude called is in error, the pilot will be notified.

Comments from aircrews included:

(1) "This call is superfluous since it is required over the UHF radio to the controlling agency."

(2) "This call is distracting and impractical during a GCA."

(3) "I set my inbound course 6° in error. The Nav had me 5° off course when I made this call. He caught the error."

The basic concept behind this call is not only to crosscheck position and altitude, but also to alert all crew members of a descent while in close proximity of the ground. Once this call is made, **all** crew members should be actively engaged in monitoring the approach.

TECHNIQUE: From the final approach fix inbound, the pilot not flying the aircraft will report airspeed deviations of more than five knots below or more than 10 knots above the planned approach speed: "Airspeed minus six," "Airspeed plus 12." Acknowledgement is required.

Typical comments included:

(1) "Terminology should be 'Six knots low' and not 'Airspeed minus six.' "

(2) "Terminology should be 'Airspeed' and not the amount different from that desired."

(3) "This call should be made when airspeed is five knots low or 15 knots above final approach airspeed."

Aircrews generally agreed that the pilot flying the aircraft should be notified of deviations in airspeed, but disagreed on terminology and tolerances. The point to remember is that crews should insure that airspeed deviations are brought to the pilot's attention. Each crew should discuss airspeed limits and terminology to be used when alerting the pilot flying of deviations.

TECHNIQUE: From glide slope interception inbound during ILS approaches, the pilot not flying the approach will report, over interphone, course deviations greater than one-half dot and glide slope deviations approaching one dot unless a proper correction is being initiated: "Course" "Glide Slope."

Criticism of this item during the test program was that it should be utilized as a technique and not as a procedure. The tolerances mentioned in this item seemed to be generally acceptable to all crew members. Again, as in the airspeed deviation calls, each aircrew should consider ILS course and glide slope deviation limits and what terminology should be used to bring this information to the pilot's attention.

TECHNIQUE: From the final approach fix or glide slope interception inbound to the DH/MAP, the pilot not flying the approach will notify the pilot flying if the vertical velocity differs by more than 200 feet from the planned descent rate: "Sink 1100."

Comments included the following:

(1) "Terminology 'Sink' is confusing." " 'VVI' or 'Descent' are better terms."

(2) "Use 1,100 FPM as a maximum limit and not a difference of 200 feet from desired."

(3) "Change the 200 feet difference to 300 feet."

Aircrews agreed on the requirement for an excessive descent rate call out but disagreed on terminology and tolerances. Feedback from the test program indicates that each crew should develop a technique to prevent excessive descent rates on final approach.

TECHNIQUE: During all instrument approaches, the pilot not flying will announce when he has some portion of the runway environment in sight with the clock position: "Cue-12 o'clock." When this call is made, it will alert the pilot flying the approach to begin to bring outside references into his crosscheck. The pilot not flying the approach will announce when, in his opinion, he can see enough of the runway to insure a safe landing: "Runway." If this call is not made prior to DH/MAP, the pilot flying will call "Missed Approach" and execute a go-around. If the call is made before DH/MAP, the pilot should evaluate the visual references and formulate a decision to land or execute a missed approach.

Comments included:

(1) "The technique is good but what is seen should be called instead of a flagword."

(2) "Calls should be combined into one call."

(3) "These calls should only be used during actual IFR conditions and not in VFR."

Whenever an approach is flown in a low ceiling/low visibility environment, it is imperative for the pilot to transition from instrument to visual flight in a smooth and efficient manner. This is an extremely critical phase of flight with little room for error or confusion. Every crew should have a crew developed technique to insure that efficient meaningful communication takes place when the runway environment is first sighted during an actual instrument approach.

TECHNIQUE: If one pilot is to fly the approach and the other is to accomplish the landing, the following procedures will be used: When transfer of control is accomplished, the pilot taking control of the aircraft will state he has control of the aircraft and also his intentions: "I have it — landing."

This technique received generally favorable comments from the flight crews. However, most aircrews felt the terminology should be "I have the aircraft — landing." The important point to remember is that control of the aircraft is being transferred close to the ground and there is no margin for unclear communication. As an added benefit, this is a good time to inform the crew what is being done with the aircraft, landing or missed approach.

TECHNIQUE: During all approaches, the pilot not flying the approach will, at 100 feet HAT, call vertical velocity to the nearest 100 feet: "Sink 600." If vertical velocity at this time is more than 800 FPM, a go-around should be considered. **KC-135 ONLY** — During all approaches, the pilot not flying the approach will call 50 feet absolute altitude on the radio altimeter: "50 feet." When this call is made, the aircraft should be in a stabilized attitude over the runway in a position to execute a normal touchdown or a go-around will be accomplished.

These two items received numerous unfavorable comments during the test program. The negative comments appeared to be based on the distraction caused by making these calls when it was felt that both pilots should be concentrating on outside references. However, the primary purpose of these calls was to force the pilot not flying the approach to maintain an instrument crosscheck and notify the pilot flying of deviations in airspeed, glide slope, and descent rates. If both pilots go visual at minimums, a possibility exists of both pilots encountering the same visual illusion, or an excessive descent rate going undetected. A recent National Transportation Safety Board report showed that 17 air carrier mishaps occurred after the pilots had gone visual. Many air carriers have implemented procedures requiring that altitude call outs be made until just prior to aircraft touchdown. The importance of one pilot monitoring instruments after minimums in marginal weather conditions cannot be overemphasized.

The techniques listed in this article are the result of an intercommand conference, tech-data research, and conversations with numerous aircrew members. It is not intended that these techniques be thought of as procedures. Crew members may disregard, utilize, or modify these techniques to their individual needs. They were all designed with a common goal in mind — a safe and uneventful landing.

RADIO ALTIMETER

Continued from page 7

As you can see, these airline crew coordination callouts do not end at DH/MDA. In a low visibility environment, the *most critical* phase of flight begins at the DH/MDA. The strong tendency to dive at barely-visible approach lights in low visibility conditions cannot be overstated. (See "Approach Lights in Sight," *Aerospace Safety*, Dec 77.) By requiring the pilot not flying the aircraft to maintain an active instrument cross-check to touchdown, while the other pilot attempts to use composite or visual techniques, the airline expects that large descent rates, excursions from target airspeed, ground proximity, and deviations from course and/or glidepath will be detected and corrected. The absolute altitude of the aircraft as shown on the radio altimeter is an important aspect of this instrument cross-check below DH or MDA. A large descent rate below 100 feet AGL can easily result in a less than satisfactory, perhaps even an unsafe, landing.

VISUAL APPROACHES

In visual meteorological conditions, the task of flying the aircraft to a safe landing is somewhat less complicated since the visual cues are much more distinct. We do have some command-directed constraints, such as the requirement to be established on final approach at least 500 feet above field elevation or on VASI glidepath. By setting 500 feet in the MDA index, the radio altimeter can serve as a memory aid and safety monitor. If the light comes on and you have not rolled out on final, you can start asking why and taking whatever actions are necessary to make a safe landing approach.

On night VFR approaches to "black hole" runways with very limited peripheral area lighting, you can set 35 feet in the radio altimeter as a "start to flare" warning. You can make a normal VFR approach using VASI glidepath, if available, or a controlled rate of descent around 500 FPM while looking at the runway lighting for proper flare cues. If the MDA light comes on and you have not begun to think about a flare, it is a strong suggestion that you should start a gentle landing flare. After all, you may have forgotten that this is a 150- or 200-foot-wide runway, instead of the SAC-standard 300-foot-wide job. It can save you the embarassment of trying to flare five feet *below* the ground.

GROUND PROXIMITY WARNING SYSTEM?

Someday the tanker may be equipped with the latest, state-of-the-art GPWS. In the meantime, those of us who fly the tanker must use all of our available instrument aids and our crew resources to fly as safely and efficiently as we possibly can. For a start, don't set the MDA index to -20 just to save electricity and increase the life of the bulbs. Use it! Fly safe.

CINCSAC COMMENTS

OPEN LETTER TO COMBAT CREW AND SUPPORT PERSONNEL

Recently I received a complimentary letter from William B. Bader, Assistant Deputy Under Secretary of Defense for Policy, after he visited Grand Forks AFB. Dr. Bader was highly impressed with the professional competence and dedication he had observed among commanders, combat crew and maintenance people during his visit. While Dr. Bader's comments single out individuals he met at Grand Forks AFB, I am sure that he would have been equally impressed by SAC people at any other base. Dr. Bader expressed his feelings so well that I asked his permission to share excerpts from his letter with all SAC members.

> *Dear General Ellis*
>
> *During the last part of February , I had the opportunity to visit Grand Forks AFB . . .*
>
> *While in Grand Forks, I was hosted and briefed by Colonel George Holt, Commander of the 321st Strategic Missile Wing, and by Colonel John Brashear, Commander of the 319th Bomb Wing. I know you appreciate the taxing and often extremely difficult circumstances under which the officers and men of these Wings live and operate. I wanted to report to you that I was deeply impressed with the professional seriousness and competence, as well as the personal warmth and hospitality of Colonels Holt and Brashear. I found it reassuring — both as an officer of our government and as an American — to find such dedicated and highly professional officers doing such a serious bit of work with such a high order of skill and good humor.*
>
> *I met and talked with a large number of officers and men who serve under Colonel Holt and Colonel Brashear; and it is indeed difficult to single out any one of them. Capt Lee Hohmann and 2nd Lt David Kloes of the launch control center GOLF ZERO displayed a sense of quiet confidence and technical skill that should be seen by every American who wonders whether these missiles are in the right hands. I was particularly impressed with Lt Dick Sample, who has the unenviable job of maintenance officer for Minuteman III in weather and conditions that I would have thought unmanageable.*
>
> *At one point during the trip to Grand Forks, I listened to a crew brief on their planning and mission. It was done in a highly professional and convincing fashion and I came away convinced not only that the mission was possible but that the assignment could not have been in better or more competent hands than the crew of that particular B-52H. Both the country and the Air Force should be pleased and reassured that we have such fine and dedicated officers as the Aircraft Commander, Capt Dennis Berg, in command of such critical national assets . . .*
>
> *I want to place on record an important bonus from the trip to Grand Forks — a deep respect and admiration for the men who make it all happen.*
>
> *William B. Bader*
> *Assistant Deputy Under*
> *Secretary for Policy*

OPS HAZARDS

IN AND OUT During descent on final approach, a KC-135 experienced a near mid-air collision with a civilian aircraft. The tanker was cleared for the approach and during the descent, approach control issued advisory traffic. The crew spotted a single-engine aircraft ahead and below approximately paralleling their course. The SAC aircraft then went into IMC during the descent. Upon breaking out of the clouds the crew spotted a small civilian aircraft, apparently the same one given in the advisory, rolling out on a head-on collision course at the same altitude. The SAC pilot pulled up to avoid collision and the civilian aircraft passed under the tanker's right wing. The crew was able to identify the aircraft in detail except for the tail number. The pilot of the KC-135 continued the approach, reported incident to approach control and later filed a near-miss report.

A review of the approach control tapes revealed that the aircraft issued as traffic was most probably the near-miss aircraft. After issuing traffic and receiving an acknowledgement that the traffic was in sight the approach controller was not aware of subsequent IMC conditions and did not reissue the traffic. The weather facility did not indicate that any IFR weather would be encountered on the approach. The civilian aircraft was not in contact with RAPCON and no further identification of the civilian aircraft could be obtained.

The effective use of the see and avoid concept by the KC-135 crew probably averted a disastrous situation. Aircraft operating IFR in VMC must continue to use the see and avoid concept. When a pilot reports traffic in sight in VMC and then enters IMC, good operating practice is to alert the controller and/or ask for further traffic advisories.

HEADING SYSTEMS FAILURE

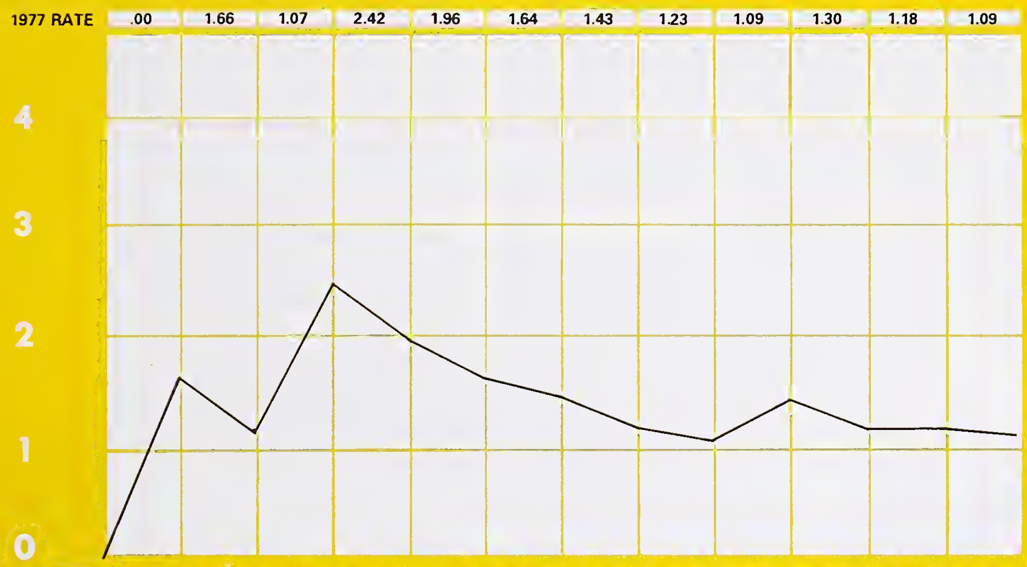
While flying on an OB route, the pilot noted that his horizontal situation indicator was apparently 30 degrees off the desired heading; however, while cross checking on the next leg in straight and level flight, the heading was good. Just prior to the IP the pilot checked his heading and found both systems unreliable. The crew completed the bomb run leg VFR then aborted the route. They used the directional gyro (DG) and ATC radar vectors to return to home station. The pilot elected to discontinue use of the DG on the return because of precession. A no-gyro approach was flown to an uneventful landing.

Investigation revealed that a power transformer in the J-4 system had shorted and resulted in loss of the J-4 amplifier. The short was the result of worn insulation on a wiring bundle. Subsequent failure of the J-4 gyro occurred because of the amplifier failure. The AJN-8 system failure was caused by the heading computer of the heading control amplifier. The reason for failure of the computer could not be determined. The directional gyro precession was determined to be within limits.

In the event of loss of the AJN-8 heading systems, aircrew members should be aware of backup systems available which include the astrotracker, directional gyro, stand-by magnetic compass and the SRAM guidance system. In most occasions a reliable heading reference may be obtained by cross checking these systems, when available.

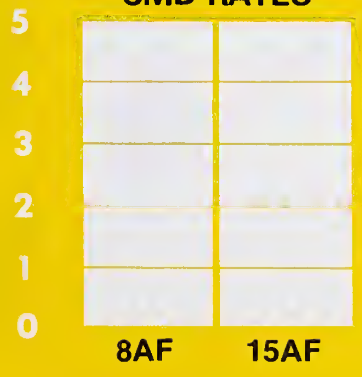
1978 Flying Safety Rate

SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)



MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1977	0	1	0	2	0	0	0	0	0	1	0	0
1978	0	0	0	0								

1978 SUBORDINATE CMD RATES



MISHAP STATUS

LEGEND ⁀ =1977 RATE

r&d corner

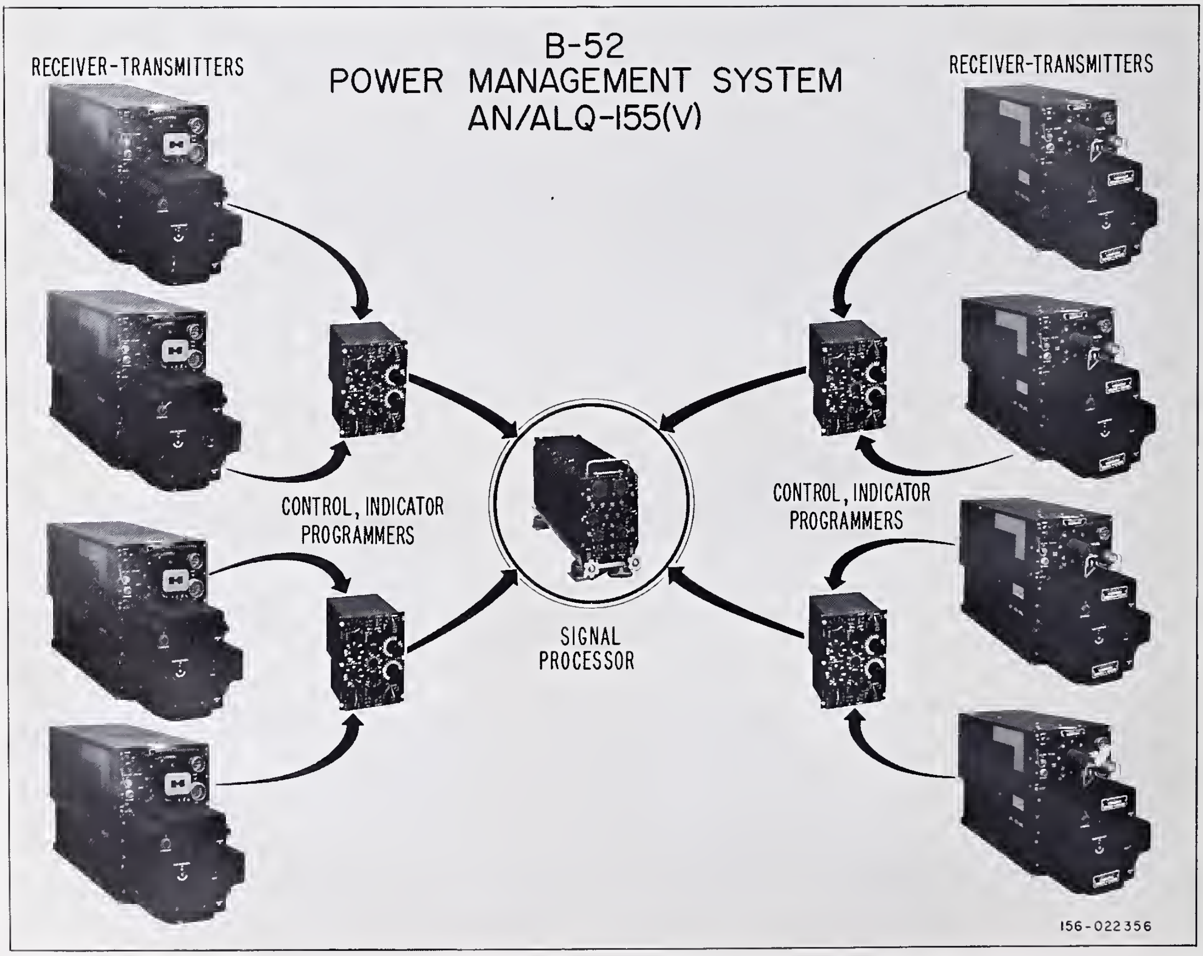
HQ/SAC — DIRECTORATE OF AERONAUTICAL REQUIREMENTS

Lt Col George C. Metz
HQ SAC/XPHN, Offutt AFB

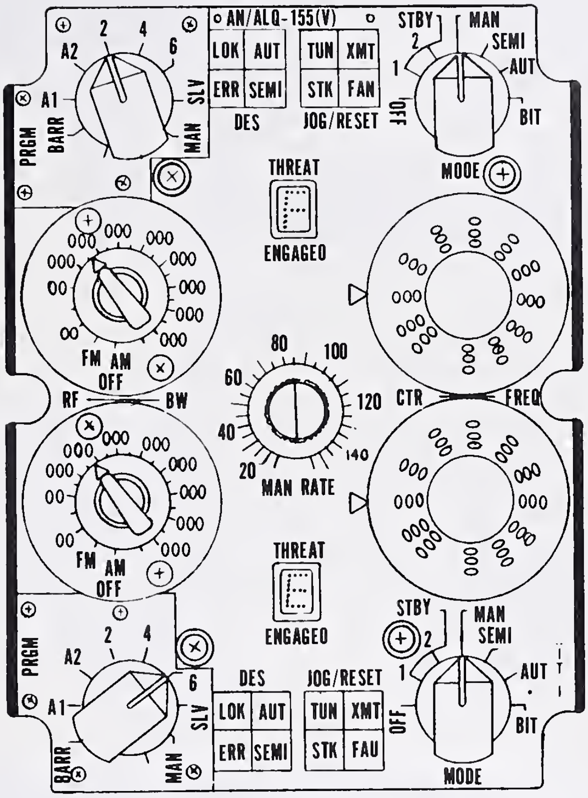
This month the R&D Corner looks at two programs which will have a large impact on the defensive capabilities of B-52 G/H aircraft. The first program is the B-52 Power Management System (PMS) and the second is called B-52 Transmitter Improvement. Since both programs are closely related, it is appropriate to consider them together. A close look will also provide some insight into the equipment acquisition process, a subject which will be discussed at length in the future.

SAC GOR (General Operational Requirement) 3-74 formally established the requirement for a computer-controlled system to manage ALT-28 jammer assets. Although there are several modes of operation ranging from automatic to manual, these systems remain under positive control of the electronic warfare officer. An interface processor brings together inputs from the ALT-28s, the ALQ-117s, the ALR-46 and ALR-20A to assist him in applying his jammers and to insure maximum utilization of available jamming resources.

Shortly after SAC's requirement was published in January 1974, Aeronautical Systems Division (ASD) of Air Force Systems Command began engineering development of a candidate system. Simultaneously, work began to configure the AN/ALQ-



A pictorial display of the power management system components. The ALR-46, not pictured, also ties into the signal processor.



The Production Power Control Indicator/Programmer, when compared to the equipment pictured on pp 3-48 and 3-48A of the B-52D-1-2, portrays the advances that have been made by power management and the AMRL efforts.

T4 trainer at the 6570th Aerospace Medical Research Laboratory (AMRL), WPAFB OH, with the prototype PMS equipment in the projected console arrangement. Flight testing of prototype equipment, now nomenclatured AN/ALQ-155, on a B-52H began in November 1976 and was completed in March 1977. At the same time, the human factors evaluation began at the AMRL. Its purpose, using 24 representative SAC crewmembers, was to evaluate the overall EW console design and PMS equipment control configuration. Data from the flight test and AMRL efforts dictated changes to increase effectiveness and operability prior to production. These changes were made and USAF approval was received for full scale production. Contracts to both the Northrop Corp and the Boeing Company were awarded in December 1977. B-52 G/H aircraft will be modified with the equipment during future scheduled depot maintenance.

The second program, requesting conversion of B-52 G/H jamming systems 13 and 14 to ALT-28s was generated by SAC GOR 8-75, published in November 1975. Because of the clear interaction between this and the PMS program and because no flight testing was required due to commonality with installed equipment, this modification could be accelerated and integrated with the PMS program at considerable savings to the Air Force. These systems, now ALQ-155s, will be installed at the depot as each aircraft receives the power management modification.

Obviously, a great deal has been left unsaid for security reasons. However, for those desiring information on the improved capabilities and enhanced man-machine interface afforded by these modifications, read the SAC Final Report, *ALQ-155 Power Management System IOT&E,* 15 Jun 77, available at the wing Penetration Aids Office. For those interested in the AMRL study, the B-52 EWO crew console *Human Engineering Report, 1977 Configuration,* is scheduled for near term release and will also be available at the Pen Aids Office. These two documents will provide an excellent source of detailed information on the operation of the prototype ALQ-155 and the changes you can expect to see in the production systems. We wish to thank those of you who participated in evaluating the ALQ-155 and the console configuration. Your criticism and comments were invaluable and directly influenced the final configuration. We will continue to seek such advice during the development of future electronic warfare equipment for the B-52: The Electronically Steerable Antenna System (ESAS) is currently being developed. AMRL evaluation of this system is scheduled to commence January 1980.

Notes of interest. The ALR-46 Radar Warning Receiver has been approved to replace the APR-25 in B-52D aircraft. A Ground Proximity Warning System is now under development for the KC-135 aircraft.

The FB-111A simulator is currently being modified with a day/night computer generated imagery visual system. The new device will be ready for training in late April 1978. The new MSR-T1 Threat Reaction Analysis Indicator System (TRAINS) Test and Evaluation is being conducted at La Junta STR. Look sharp EWs; TRAINS is watching!

Next month: FB-111 simulator visual systems attachment.

PROFESSIONAL PERFORMERS

Individuals selected for these pages as SAC's top professional performers of the month are chosen from nominations made by all SAC units. Selection is made only after all nominations have been carefully screened and those chosen meet the highest standards of excellence outlined in SACR 127-2.

1Lt Larry C. Hazard, 22nd AREFS, March Air Force Base

HEADS UP FLYING CLUB

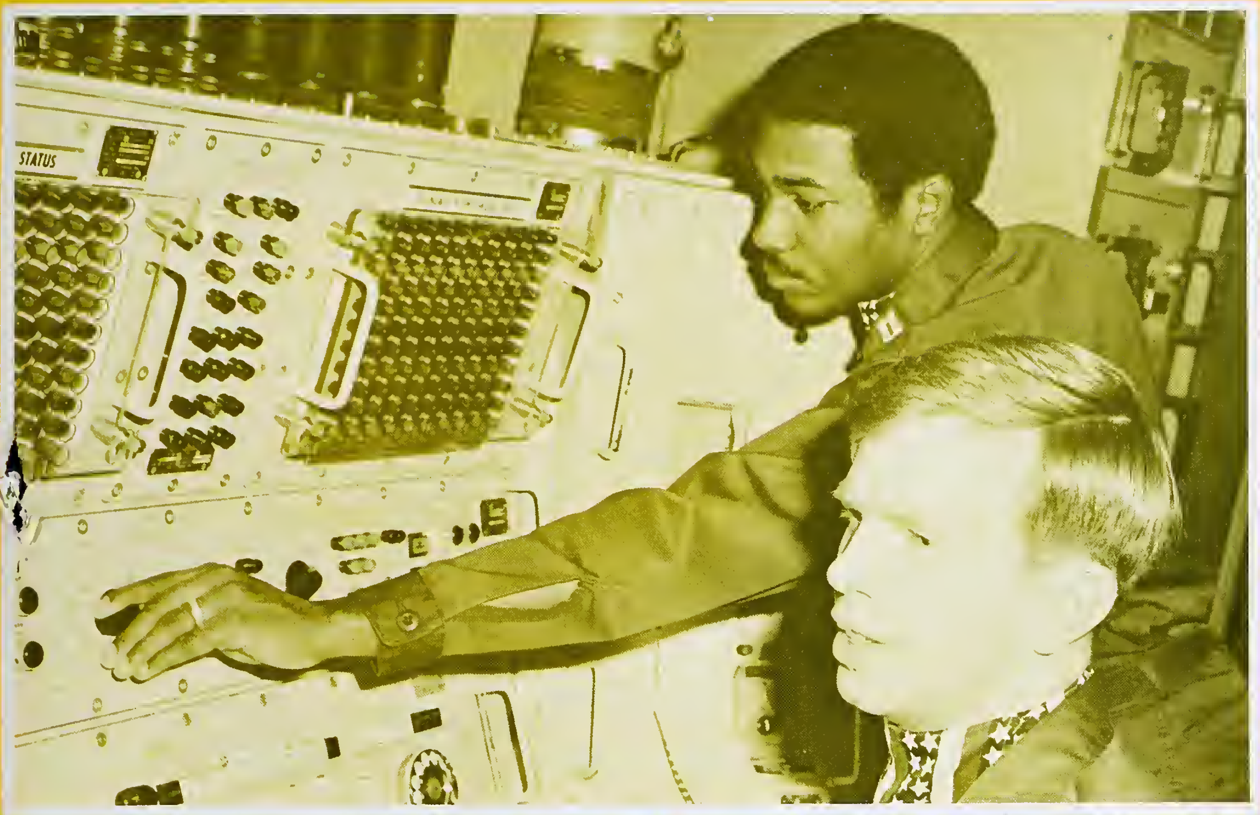
1Lt Larry C. Hazard, 22d AREFS, March Air Force Base.

Lt Hazard and his crew took off as number two in a MITO. Initial rotation and clean-up procedures were uneventful. However, during the first turn at 1400 feet AGL and 230 knots, a midair collision was narrowly averted. Lt Hazard sighted a light plane bearing down on his aircraft. He immediately took control of the tanker and forcefully pushed forward on the yoke while maintaining a 30° bank angle. Minor damage to the tail of the aircraft occurred because of the violence of the maneuver, but he avoided the smaller airplane by 75 to 100 feet. Lt Hazard's instant and accurate assessment of an extremely dangerous situation and his subsequent reaction prevented the loss of two aircraft and possibly several lives.

TITAN CREW R-131, 308th Strategic Missile Wing, Little Rock AFB: MCCC 1Lt John R. Davis, Jr., DMCCC 2Lt Glenn T. Whitaker, MSAT SrA Stephen L. Roach, and MFT A1C Silas Johnson.

TITAN

Crew R-131 recently distinguished itself by being designated a Highly Qualified mission ready missile crew. This honor was received following a stringent no-notice evaluation of the crew's weapon system and emergency war order procedural skills conducted by 308th SMW Standardization-Evaluation Division personnel. The superb performance of this crew reflects the professional ability and personal pride of each crewmember. The operational expertise of this crew is especially noteworthy when considered with the additional duties performed by the crew. Lt Davis is the squadron monitor for highly critical precision measurement equipment laboratory items and all safety equipment at each of the squadron's nine missile complexes. In addition, he is the officer in charge of the Little Rock AFB Honor Guard. Lt Whitaker is the Wing Assistant Disaster Preparedness Officer and serves the squadron as Assistant Supply Officer. Both SrA Roach and A1C Johnson received letters of appreciation for their personal sacrifice of off-duty time while installing security signs at each of the 374th SMS missile complexes.



MINUTEMAN Crew E-199, 341st Strategic Missile Wing, Malmstrom AFB: MCCC Captain Ronald K. Washington, and DMCCC 1Lt Ty M. Lagerberg.

MINUTEMAN

During his inspection of the LCC, Capt Washington noted that a communications tile on his console was shorting to ground and smoke was coming from the panel. Realizing the potential existed for total loss of communications and EWO capabilities, he quickly placed a call to communications job control (CJC) from the deputy's console. With concurrence of CJC, the particular tile and corresponding light bulb were removed and isolated. As a result of his quick action and accurate assessment of the situation, only MCN to S-33 was lost and shutdown of the command console and other associated equipment was averted, thus maintaining the ability of the LCC to issue critical commands. At approximately 0330, during the same alert tour, Lt Lagerberg noticed smoke emanating from the system printer on the status console. Using his knowledge of equipment overheat procedures, the printer's overheat was promptly isolated. As a result of Lt Lagerberg's action, the status monitoring capability of the LCC was maintained at as high an extent as possible. Capt Washington and Lt Lagerberg are a senior crew in the Minuteman II Command Data Buffer weapon system.

MAINTENANCE MAN

As shift chief and assistant work center supervisor in the avionics instrument shop, Sgt Coons established an outstanding record of valuable contributions to the maintenance function. He is recognized as an expert in his field and performs all maintenance in a highly professional manner. Since his assignment as shift chief, his area of responsibility received excellent ratings on each staff visit and operational readiness inspection (ORI). He received an outstanding task rating from the SAC Maintenance Standardization and Evaluation Team (MSET) during their last visit. He was instrumental in the development of an adapter box which prevents the loss of test equipment adapter fittings. This FOD prevention device is being considered for SAC-wide use. Sgt Coons is a dedicated noncommissioned officer and a valuable asset to the SAC maintenance function.

SSgt Melvin A. Coons, 22d Avionics Maintenance Squadron, March Air Force Base.

HALL OF FAME

TACTICAL FLYING

OVER TWENTY-ONE YEARS

170 AREFG, McGuire (NJANG)	NONE
171 AREFW, Greater Pittsburgh (PAANG)	Mar '58

OVER NINETEEN YEARS

157 AREFG, Pease (NHANG)	Jun '58
97 BMW, Blytheville	Aug '58

OVER EIGHTEEN YEARS

940 AREFG, Mather (USAFR)	May '59
307 AREFG, Travis	Sep '59

OVER SEVENTEEN YEARS

19 BMW, Robins	Oct '60
151 AREFG, Salt Lake City (UTANG)	Feb '61
161 AREFG, Sky Harbor (AZANG)	Apr '61
126 AREFW, Chicago O'Hare (ILANG)	Apr '61

OVER SIXTEEN YEARS

134 AREFG, McGhee Tyson (TNANG)	Aug '61
340 AREFG, Altus	Feb '62

OVER FIFTEEN YEARS

301 AREFW, Rickenbacker	Jul '62
96 BMW, Dyess	Aug '62

OVER THIRTEEN YEARS

160 AREFG, Rickenbacker (OHANG)	Dec. '64

OVER TWELVE YEARS

320 BMW, Mather	Jul '65

OVER ELEVEN YEARS

452 AREFW, March (USAFR)	Sep '66
92 BMW, Fairchild	Feb '67

OVER TEN YEARS

55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67
319 BMW, Grand Forks	Dec '67
22 BMW, March	Feb '68

OVER NINE YEARS

5 BMW, Minot	Feb '69

OVER EIGHT YEARS

42 BMW, Loring	Sep '69
141 AREFW, Fairchild (WAANG)	Oct '69

OVER SEVEN YEARS

28 BMW, Ellsworth	May '70

OVER SIX YEARS

7BMW, Carswell	Mar '72
101 AREFW, Bangor (MEANG)	Mar '72

OVER FIVE YEARS

416 BMW, Griffiss	May '72
305 AREFW, Grisson	Aug '72
376 SW, Kadena	Nov '72
379 BMW, Wurtsmith	Apr '73

OVER FOUR YEARS

384 AREFW, McConnell	Mar '74

ICBM

OVER FOURTEEN YEARS

381 SMW, McConnell	Nov '63

OVER THIRTEEN YEARS

90 SMW, F E Warren	Jul '64
1 STRAD, Vandenberg	Sep '64

OVER TWELVE YEARS

308 SMW, Little Rock	Aug '65

OVER SEVEN YEARS

341 SMW, Malmstrom	Apr '70

OVER FOUR YEARS

390 SMW, Davis-Monthan	Jul '73

To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.

SAC SAFETY SCREEN

7 BMW, Carswell Crew S-52: IP Capt Steven M Cranford, ICP Capt Mike S Henehan, IRN Capt Robert L Hensz, IN 1Lt Mark A Mayerstein, IEW Capt Rommie G Brewer, IG TSgt Sammy E Hussong

7 BMW, Carswell Crew IT-4: IP Capt Ted K Broyhill, IRN Capt Chad T Mortensen, IEW Capt Donn M Lewis, IG MSgt Harlan C Nelson

7 BMW, Carswell Crew R-108: AC Capt Donald R Dungan, CP 1Lt Guy V Amerson, N Capt Glen K Scott Jr, BO A1C Martin A McElroy

7 BMW, Carswell Crew E-17: AC Capt Paul N Paris Jr, CP 1Lt Michael Bingham, RN Capt John O Mullenax, N 1Lt Tommy D Dickson, EW 1Lt Thomas A Richey, G TSgt James Dowd

43 SW, Andersen Crew E-05: P Capt James B Edenfield, CP Capt Mark C Whitelaw, RN Capt Lynne C Thompson, N Capt Donald L Pennington, EWO 1Lt Bradley W Volk, G SSgt Charles W Swanberg

44 SMW, Ellsworth Crew R-021: MCCC 1Lt Leland M Caulder, DMCCC 2Lt Mark E Aden

62 BMS, Barksdale Crew S-03: AC Capt Sigourney D Hall, CP Capt Robert E Pryor, RN Capt John N Milligan, N Capt Don L Mooring, EWO Capt Lewis B Sedberry, G SSgt Gary W Frederick

71 AREFS, Barksdale Crew E-166: AC Capt Ronny J Sanders, CP Capt James Mateos Jr, N Capt John L Weisz, BO A1C Steven H Graham

71 AREFS, Barksdale Crew R-169: AC Capt David M Hollingsworth, CP Capt Phillip M Poynor, N Capt Scottie L Smith, BO A1C Lawrence L Stockton

90 SMW, F E Warren Crew E-113: MCCC Capt Bennie A Cline, DMCCC 1Lt William Alcorn

91 SMW, Minot Crew R-012: MCCC 1Lt Robert L Miller, DMCCC 2Lt Anthony R Johnson

321 SMW, Grand Forks Crew S-166: MCCC Capt Billy L Pohlad, DMCCC 2Lt Wayne L Andrews

340 AREFG, Altus Crew E-115: AC Capt Richard D Hawk, CP Lt Robert A Dunn, N Lt Steven J Kent, BO SSgt Lawrence W Thompson

351 SMW, Whiteman Crew R-012: MCCC 1Lt John R Buck, DMCCC 2Lt Richard J Lucas

381 SMW, McConnell Crew S-095: MCCC Capt Don E Hale, DMCCC 1Lt Jeffrey S Heussner, BMAT Sgt Glen D Goodspeed, MFT SrA Clarence A Burtts

390 SMW, Davis-Monthan Crew S-103: MCCC Capt Charles D Harris, DMCCC 1Lt James R Burling Jr, MSAT Sgt Richard L Veder, MFT SrA Thomas A Geiger

596 BMS, Barksdale Crew E-60: P Capt Louis M Edwards, CP Capt James W Smail, RN Capt Charles M Henges, N Capt Theodore P Wieler, EWO 1Lt Thomas D Martin, G Sgt Robert R Ashley

913 AREFS, Barksdale Crew S-101: P Maj Jesse C Caviness Jr, CP Capt Wayne D Harper, N Capt Michael D Overstreet, BO MSgt Wilton L Coleman

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW SACR 127-2.*

★U.S. Government Printing Office
1978-765-129/3

KALBERER AWARD WINNER

Captain Jerry O. Foote, 416th BMW, Griffiss AFB, is named as this year's recipient of the Major General Alfred F. Kalberer Outstanding Airmanship Award. Captain Foote was selected for his unusual skill and courage when he was able to taxi a KC-135 away from an adjacent burning aircraft, with only the left outboard engine running and without nose wheel steering. His action definitely saved one aircraft and prevented a possible chain reaction of aircraft explosions on the ramp.

In naming Captain Foote for this award, General Richard H. Ellis, CINCSAC, said, "Captain Foote's response reflects not only extraordinary courage and skill but considerable ingenuity."

The incident for which Cpatain Foote was cited occurred on March 4, 1977. On that date, Captain Foote was conducting the preflight inspection of a KC-135 aircraft when another KC-135 located across the parking ramp suddenly burst into flames. Realizing that the burning aircraft would soon be a total loss, Captain Foote's attention was immediately directed toward a KC-135 aircraft parked adjacent to the one now engulfed in flames. With total disregard for his own safety, Captain Foote deplaned from his aircraft and rushed across the ramp to the KC-135 that was in obvious jeopardy of burning. As he approached the scene, the intense fire and spontaneous explosions, with their resulting shock waves, were practically unbearable. After directing maintenance personnel to assist him, Captain Foote climbed into the pilot's seat and prepared the endangered aircraft for engine start. During the engine starting process, he could feel fragments from the burning aircraft striking his aircraft. Although Captain Foote realized the obvious threat to his own life and the maintenance personnel assisting him, he persisted in moving the endangered aircraft.

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FLARE